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# California Regional Water Quality Control Board Central Valley Region

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**TO:** RUSSELL W. WALLS  
Senior Engineer

**FROM:** ANTHONY MEDRANO  
Sanitary Engineering Associate

**DATE:** 27 September 2005

**SIGNATURE:** \_\_\_\_\_

**SUBJECT: ROOT CREEK WATERSHED COALITION ANNUAL MONITORING REPORT,  
CONDITIONAL WAIVER OF WASTE DISCHARGE REQUIREMENTS FOR  
DISCHARGE FROM IRRIGATED LANDS RESOLUTION NO. R5-2003-0105 AND  
MONITORING AND REPORTING PROGRAM ORDER NO. R5-2003-0826**

## **Background/Administrative Review:**

On 1 April 2005 the Root Creek Watershed Coalition (RCWC) submitted a "Provisional Annual Monitoring Report" in accordance with the Conditional Waiver of Waste Discharge Requirements for Discharge From Irrigated Lands, Resolution No. R5-2003-0105 and Monitoring and Reporting Program Order No. R5-2003-0826. This report was incomplete and lacked some analytical results from the first sampling event and contained no analytical result for the second stormwater sampling event. In addition, the "Provisional Report" indicates that no sediment toxicity samples were collected during the first stormwater monitoring event. On 22 June 2005, staff received a "finalized" version of the Annual Monitoring Report (Annual Report) that contained the original data from the "Provisional" submittal, with additional information, including missing data for the first monitoring event and data for the second stormwater sampling event. The analytical data tables included in the Annual Report were reflective of all work performed to date. Quality assurance/quality control (QA/QC) samples were collected at the appropriate frequency and the analytical results were reported in table format as required.

Also included in the Annual Report are copies of the Chain-of-Custody (COC) forms from both sampling events. Some of the COCs were incomplete. Specifically, COCs for E. coli and Toxicity were incomplete in that the "Received By" signature and time block were not filled out. Chain of Custody (COC) documentation needs to be preformed in accordance with Attachment A of Resolution R5-2003-0826 pages 5 and 6. Completed field sampling data log sheets for each monitoring site and for both sampling events were included in the Annual Report. According to the Annual Report, in an attempt to satisfy the Pesticide Use Evaluation as set forth in the MRP, RCWC sent out a Management Practices Questionnaire to participating landowners in the watershed. The questionnaire asked growers to provide information regarding methods used for pesticide mixing and loading and application for each crop and field for the 2004 growing season. Approximately 7,155 pesticide applications were documented in 2004 within the RCWC area. In addition, the approved MRP states that the Annual Report would

contain a matrix and analysis of the questionnaire data. This analysis was not provided in the Annual Report. The MRP states that a “*Pesticide Use Evaluation must be conducted to determine the pesticide use pattern in land areas upstream of the monitoring sites.*” Tables 11-1 and 11-2, give a list of Section, Township, and Range locations within the watershed, and a separate list of all chemicals recorded to have been used within the RCWC area, respectively. The Annual Report contains no evaluation to determine patterns of use in areas within the coalition, nor any attempt to correlate the pesticide usage with specific irrigated lands.

### **Watershed Description/Observations:**

The Root Creek watershed area lies within the San Joaquin River Basin in the southeastern portion of Madera County in the San Joaquin Valley. At the northern border of the Root Creek watershed is Little Dry Creek and at the southern border of the watershed runs the San Joaquin River. Root Creek runs through the center of the watershed area (Figure 1) and drains the eastern, northern, and southern portions of the watershed. According to the Annual Report, the main watershed area is approximately 40,800 acres; of this approximately 28,600 acres are irrigated with surface or groundwater. Around 15,000 acres of the irrigated lands within the watershed are voluntarily participating in the RCWC, roughly 52 percent. Other drainage-ways within the watershed include Madera Ranchos North and Madera Ranchos South. These ephemeral bodies primarily drain the urban areas located in the northern section of the subject watershed. All drainage-ways in the RCWC terminate in ponding areas located east of the Atchison, Topeka and Santa Fe Railroad (Figure 1). The Annual Report also states that unless stormwater rises high enough to cross Avenue 12 to Cottonwood Creek, which is in an adjacent watershed, all stormwater contained in the terminal ponding areas evaporates. Little or no infiltration occurs due to underlying hardpan.

The Annual Report states that the RCWC determined that the watershed does not have any uncontrolled tail water, or subsurface or surface drainage that leaves the RCWC members property. Furthermore, based on this determination, it was agreed that the RCWC would only be subject to a stormwater monitoring program. The Annual Report states that no stormwater drainage was observed leaving the watershed during the 2004/2005 storm season. However, as can be seen in aerial photos (Figures 3, 4, and 5) along the San Joaquin River in the vicinity of MS3, it is clear that historically stormwater and/or irrigation runoff does leave the coalition watershed and drains to the San Joaquin River.

The Watershed Evaluation states that it was determined that the RCWC did not use any surface water for irrigation, have any uncontrolled tail water, or subsurface or surface drainage that left the RCWC property. Based on staff field observations, this assertion is not accurate. As can be seen in Figure 2, Photo D, surface water from an irrigation canal within the watershed is used to water adjacent vineyards. Figures 6, 7, and 8 also illustrate a return flow to an irrigation canal that is within the RCWC. In addition, historical aerial photos show various canals that flow within the watershed. A review of historic aerial photos illustrates various hydraulic control structures that appear to divert flow to irrigated lands within the RCWC. Figures 6, 7, and 8 show a return flow system within the canal network.

### **Sampling and Analytical Methods:**

The approved MRP states that the stormwater monitoring events would take place in January and February of each year. The Annual Report indicates that a sampling trigger would consist of three

consecutive days of half-inch of rainfall per day. This appears to be an unreasonable trigger. Last storm season was one of the highest rainfall events on record; yet, the Annual Report indicates that there were no three-consecutive-half-inch days of rainfall in the entire season. A new sampling trigger needs to be proposed and implemented prior to the next stormwater season.

The RCWC approved MRP identifies four stormwater monitoring points; MS1, MS2, MS3, and MS4, at the following locations:

**MS1** - Caltrans drain culvert on east side of RCWC area between Highway 41 Business Route and State Highway 41

**MS2** - Caltrans drain culvert on Avenue 12, approximately 1 mile west of State Highway 41.

**MS3** – Ponding area at south end of Road 38.

**MS4** – Culvert at the intersection of Road 33 ½ and Root Creek in Madera County.

Figure 9 shows the location of each of the monitoring locations. Monitoring sites MS1 and MS2 were selected to provide background conditions of upstream water quality prior to flowing into the Root Creek watershed. Monitoring site MS3 was chosen to collect representative stormwater samples that drain from permanent crop areas along the bluffs of the San Joaquin River that could possibly flow into the San Joaquin River. Monitoring site MS-4 was selected to represent the accumulated drainage from Root Creek.

Analytical results of the stormwater samples collected during Event 1, which took place on 7 January 2005, indicate that toxicity was detected for *Selanastrum capricornutum*. Laboratory data sheets indicate that a 92% reduction in growth as compared to the laboratory control sample was observed. No Toxicity Identification Evaluation (TIE) was performed as a result of the toxicity detected in the stormwater sample collected from MS4 during monitoring Event 1. In an E-mail from Provost & Pritchard to staff dated 13 January 2005, a copy of which is contained in the Annual Report, RCWC consultants informed staff of this toxicity hit at sample location MS4. The E-mail also stated that they attempted to perform a TIE but that due to the “lack of an active storm channel,” a stormwater sample could not be collected. The same E-mail also indicated that ponded stormwater was observed at the sampling site but that no sample was collected. A TIE should have been performed using a sample collected from the observed ponded stormwater. By doing so, valuable information as to the source of the toxicity could have been gained. According to the Annual Report, the same stormwater sample was analyzed for toxicity seven days later. This data showed that the toxicity was persistent, an 86 percent reduction in growth in *Selanastrum capricornutum* was observed. The report stated that no sediment toxicity samples were collected in the first monitoring event due to the presence of an excessive amount of organic material. In the first monitoring event toxicity was also observed during the Acute *Ceriodaphnia* Survival Bioassay analysis in the sample collected from monitoring site MS4. A ten-percent mortality rate was observed for *Ceriodaphnia* in this sample, which was not considered statistically significant.

During the second stormwater monitoring event, toxicity was again detected at monitoring site MS4 for *Selanastrum capricornutum*. In this instance, an eighty-two percent mortality rate as compared to the laboratory control sample was observed for *Selanastrum capricornutum*. Staff received an E-mail

regarding the observed toxicity hit, however, the E-mail indicated that no additional testing or follow-up was planned. During the Acute Ceriodaphnia Survival Bioassay analysis of the sample collected from monitoring site MS4 during the second monitoring event, a ten-percent mortality rate was observed. Sediment toxicity samples were not collected during the second monitoring event. According to the MRP a TIE should have been performed.

Overall, the physical parameters observed in the stormwater samples collected in the first stormwater event appear to be within acceptable limits with exception of elevated E. coli concentrations in both upstream samples collected from monitoring sites MS1 and MS2 in the first monitoring event. In addition, elevated conductivity was also detected in samples collected from monitoring site MS2 in both sampling events.

The analytical data for samples collected from monitoring sites MS1 and MS2 indicate that toxicity was not present in these samples for both sampling events. The RCWC states in the Annual Report that they intend to discontinue collecting samples from both monitoring sites MS1 and MS2 since no potential contaminant contribution from upstream sources appears to exist. The Annual Report also indicates that in both sampling events no samples were collected from MS3 due to lack of flow. Furthermore, the AMR states that there is no direct evidence that runoff from the vicinity of MS3 to the San Joaquin River has ever occurred and that the monitoring site should not be used in the future. No alternative location for MS3 was proposed. The assertion that stormwater runoff from the vicinity of monitoring site MS3 reaching the San Joaquin River is "highly unlikely" is inaccurate. As can be seen in Figures 3, 4, and 5, erosion features can be observed in the aerial photo showing that some type of runoff does occur in this area. An alternate site for monitoring in the vicinity of MS3 needs to be identified and implemented prior to the next stormwater season.

#### **Data Interpretation:**

The data interpretation section of the Annual Report reviewing the tabulated analysis acknowledges the water column toxicity to algae observed in samples collected from MS4 in both monitoring events. The report also states that the causative agent of toxicity was not determined. The narrative in the Annual Report postulates that the elevated physical parameters at MS4 are a result of the flow coming into the watershed via the stormwater drainage associated with monitoring site MS2. However, a review of the data provided does not indicate that elevated physical parameters were detected in the water sample from monitoring site MS4. No discussion was provided regarding the toxicity observed during both stormwater sampling events.

Section 14 of the Annual Report, *Actions Taken to Address Water Quality Impacts*, states that no specific actions were taken to address water quality impacts during the 2004/2005 stormwater season. The narrative in Section 14 also states that the information gathered for the previous stormwater season will be used to improve monitoring procedures in the future.

#### **Conclusions:**

After reviewing the subject Annual Report from RCWC, I have concluded the following items need to be addressed, provided, and/or corrected.

1. Future monitoring reports are to be complete and submitted by the prescribed deadline and are not to be submitted in segments.
2. Some Chain of Custody forms were incomplete. In the future, all Chain of Custody forms are to be completely filled out.
3. The Annual Report did not include, as proposed, a matrix and analysis of the Management Practices Questionnaire that was sent out to all farmers in the coalition. This must be provided to complete the subject report.
4. The Annual Report did not include an evaluation to determine patterns of pesticide/herbicide use in areas within the coalition, nor, was there any attempt to correlate the pesticide/herbicide usage data with specific irrigated lands. This evaluation needs to be completed and provided to complete the subject report.
5. Contrary to what the Watershed Evaluation states and based on historical aerial photos taken in the vicinity of monitoring site MS3, it is clear that on occasion runoff flows from RCWC irrigated lands to the San Joaquin River.
6. Contrary to the Watershed Evaluation provided by RCWC, irrigated lands within the subject watershed do use surface water for irrigation. Various hydraulic structures on the canal system have been identified visually and through historical aerial photos.
7. A detailed survey of the canal system and its various hydraulic structures needs to be performed to identify all return waterways to the irrigation canals and to Root Creek.
8. The sampling trigger for stormwater sampling needs to be modified. The current trigger of three consecutive days of a half-inch of rain per day is unrealistic. A new sampling trigger needs to be developed and proposed.
9. The tabulated analytical results indicate that stormwater samples collected from monitoring site MS4 in both monitoring events showed that toxicity to *Selanastrum capricornutum* was observed. In both instances, a Toxicity Identification Evaluation was not performed as is required per the MRP.
10. Stormwater samples should be collected from monitoring site MS4 if ponded stormwater is observed, regardless if "active stormwater flow" is not occurring. This will provide data needed to perform required follow-up.
11. No sediment toxicity samples were collected in either sampling event. Given the record rainfall of last storm season, it would appear reasonable that an alternate location could have been identified and sampled. An alternate sampling site in the vicinity of MS4 needs to be identified and sediment samples need to be collected during future monitoring events.
12. The discontinuation of collecting background samples from monitoring sites MS1 and MS2 appears to be appropriate.

13. The data interpretation of section of the Annual Report did not contain comments on the detection of toxicity in both monitoring events at monitoring site MS4.